

3. ESSENTIAL FISH HABITAT

3.1 Designations in the 2006 Consolidated Atlantic HMS FMP and its Amendments

The Magnuson-Stevens Act requires NMFS to identify and describe Essential Fish Habitat (EFH), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. In 2009, NMFS completed the five year review and update of EFH for Atlantic HMS with the publishing of Amendment 1 to the 2006 Consolidated HMS FMP (June 12, 2009, 74 FR 288018). In Amendment 1, NMFS updated and revised existing identifications and descriptions of EFH for Atlantic HMS, designated a Habitat Area of Particular Concern (HAPC) for bluefin tuna in the Gulf of Mexico, and analyzed fishing and non-fishing impacts on EFH pursuant to Section 305(b) of the Magnuson-Stevens Act.

In 2010, NMFS added the smoothhound management group (consisting of *Mustelus canis* or smooth dogfish, *M. norrisi* or Florida smoothhound, and more recently *M. sinusmexicanus* or Gulf smoothhound) to the species under Secretarial management in Amendment 3 to the 2006 Consolidated HMS FMP (June 1, 2010, 75 FR 30484). As a Magnuson-Stevens Act condition of adding a species to federal management, NMFS designated EFH for smoothhound using the same methodology employed in Amendment 1. Details, including a map of the final EFH, are available in Chapter 11 of the Amendment 3 FEIS.

On September 22, 2010, NMFS published an interpretive rule and final action (75 FR 57698) which, among other things, added roundscale spearfish (*Tetrapturus georgii*) to the definition of terms in the implementing regulations of the Magnuson-Stevens Act and the Atlantic HMS regulations, and defined EFH for roundscale spearfish. Roundscale spearfish and white marlin were managed as one species before this final action because roundscale spearfish were not recognized as a distinct species until recently. NMFS determined that the designation of roundscale spearfish EFH is the same as the designation of EFH for white marlin in Amendment 1 to the Consolidated HMS FMP.

On March 24, 2014, NMFS published in the Federal Register (79 FR 15959) an announcement of its next 5-year review of EFH for Atlantic HMS as required under the Magnuson-Stevens Act. The 5-year review is based on the best data available regarding Atlantic HMS and their habitats; therefore, NMFS requested submission of any such information on Atlantic HMS EFH that has become available since publication of Amendment 1 in 2009; Amendment 3 in 2010; and the interpretive rule and final action that published on September 22, 2010 that defined EFH for roundscale spearfish (*Tetrapturus georgii*). On April 3, 2014 the HMS Management Division presented the EFH 5-Year Review Plan to the HMS AP and public and requested new information to support the review.

On March 5, 2015, NMFS announced the availability of a draft EFH 5-Year Review and solicited public feedback (80 FR 11981). The EFH 5-Year Review evaluated published scientific literature, unpublished scientific reports, information solicited from interested parties, a variety of delineation methods, and previously unavailable or inaccessible data. On March 10, 2015, the HMS Management Division presented the draft EFH 5-Year Review and a summary of initial findings at the 2015 Spring HMS Advisory Panel meeting. The public comment period for the draft EFH 5-Year Review ended on April 6, 2015.

On July 1, 2015, NMFS announced the availability of the final EFH 5-Year Review and the Agency's intent to initiate an amendment to the 2006 Consolidated Atlantic HMS FMP to revise certain Atlantic HMS EFH descriptions and designations (80 FR 37598). In reviewing literature that has become available since 2009, new data emerged for certain Atlantic HMS, which warrants revision to those species' EFH descriptions and designations. For other Atlantic HMS, new data were either unavailable or it was determined that the new data did not warrant revisions to EFH descriptions and designations. However, in the upcoming amendment, new observer, survey, and tag/recapture data collected since 2009 will be used to revise EFH geographic boundaries for all species. NMFS anticipates publishing Draft Amendment 10 in the late spring of 2016.

EFH maps are presented in hard copy in Amendments 1 and 3 and electronically on the internet via spatial files in Adobe (.pdf) format. The electronic maps and downloadable spatial EFH files for HMS and all federally managed species are available on the NMFS EFH Mapper at: <http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>. A summary of the management history of HMS EFH is given in Table 3.1.

Table 3.1 Management History for HMS Essential Fish Habitat

FMP or Amendment	EFH and Species
1999 FMP for Atlantic Tunas, Swordfish, and Sharks	EFH first identified and described for Atlantic tunas, swordfish and sharks; HAPCs designated for sandbar sharks
1999 Amendment 1 to the 1988 Billfish FMP	EFH first identified and described for Atlantic billfishes
2003 Amendment 1 to the FMP for Atlantic Tunas, Swordfish and Sharks	EFH updated for five shark species (blacktip, sandbar, finetooth, dusky, and nurse sharks)
2006 Consolidated Atlantic HMS FMP	Comprehensive review of EFH for all HMS. EFH for all Atlantic HMS consolidated into one FMP; no changes to EFH descriptions or boundaries
2009 Amendment 1 to the 2006 Consolidated Atlantic HMS FMP	EFH updated for all federally managed Atlantic HMS. HAPC for bluefin tuna spawning area designated in the Gulf of Mexico
2010 Amendment 3 to the 2006 Consolidated Atlantic HMS FMP	EFH first defined for smoothhound sharks (smooth dogfish, Florida smoothhound, and Gulf smoothhound)
2010 White Marlin/ Roundscale Spearfish Interpretive Rule and Final Action	EFH first defined for roundscale spearfish (same as white marlin EFH designation in Amendment 1 to the 2006 Consolidated Atlantic HMS FMP)
2015 Atlantic HMS EFH 5-Year Review	Comprehensive Review of EFH for all HMS. Changes to some EFH descriptions and boundaries are warranted.

3.2 Shark Nursery Grounds and Essential Fish Habitat Studies

NMFS continues to study EFH for HMS to refine our understanding of important habitat areas for HMS. The Magnuson-Stevens Act defines EFH as habitat necessary for spawning, breeding, feeding, and growth to maturity. The Magnuson-Stevens Act requires the identification of EFH in FMPs, and towards that end NMFS has funded two cooperative survey programs designed to further delineate shark nursery habitats in the Atlantic and Gulf of Mexico. The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) Survey, and the

Cooperative Gulf of Mexico States Shark Pupping and Nursery (GULFSPAN) Survey are designed to assess the geographical and seasonal extent of shark nursery habitat, determine which shark species use these areas, and gauge the relative importance of these coastal habitats in order to provide information that can then be used in EFH determinations. Also, survey data collected are being incorporated into stock assessment models as abundance trends and life history parameters.

The COASTSPAN program, administered by the NMFS Northeast Fisheries Science Center's Narragansett, Rhode Island laboratory, has been collecting information on shark nursery areas along the U.S. Atlantic coast since 1998. It involves NMFS scientists along with state and university researchers in Massachusetts, Rhode Island, New York, New Jersey, Delaware, Virginia, North Carolina, South Carolina, Georgia, Florida and the U.S. Virgin Islands. NMFS initiated the GULFSPAN program in 2003 to expand upon the COASTSPAN Survey. This cooperative program, which is administered by the NMFS Southeast Science Center's Panama City, Florida laboratory, includes, in addition to NMFS scientists, the states of Florida, Alabama, and Mississippi. Following is a summary of the results from the 2014 COASTSPAN and GULFSPAN surveys (Bethea et al., 2013; McCandless pers. comm.).

Massachusetts

Limited sampling was conducted in Plymouth Bay in August of 2014 by the Massachusetts Division of Marine Fisheries. The shark catch consisted entirely of immature sand tiger sharks. This area continues to provide important summer nursery habitat for this prohibited species.

Rhode Island

Juvenile sand tigers were caught off Point Judith, Rhode Island in June of 2014. These results continue to provide supporting evidence that Rhode Island waters are used at a minimum as transitional nursery habitat by this prohibited species during their migrations to northern waters.

New York

COASTSPAN sampling was conducted in Shinnecock Bay, New York in 2014 by Stony Brook University. No sharks have been caught in this bay during summer COASTSPAN sampling to date. Shinnecock Bay does not appear to provide sharks with summer nursery habitat or resources for any other life stage at this time. The COASTSPAN program previously provided sampling gear and tagging supplies for this survey, but the costs for running the survey are covered by the COASTSPAN cooperators. Even though the bay does not currently support shark populations, this multispecies survey has continued to provide data on the presence/absence of elasmobranchs in an attempt to document any changes in distribution, potentially resulting from climate change.

New Jersey and Delaware (Delaware Bay)

COASTSPAN sampling encompassed the entire bay from the mouth of the Delaware River to the mouth of Delaware Bay using a random stratified design based on depth and geographic location. Additional sampling was also conducted at historical fixed stations

throughout the bay. Sandbar shark was the most abundant shark species caught in 2014, followed by smooth dogfish and sand tigers. In 2014, three adult male Atlantic sharpnose sharks were also caught in Delaware Bay and one juvenile spinner shark was caught near Brandywine Shoal in waters near ocean salinities. Additionally, three young-of-the-year dusky sharks were captured at three separate locations in August 2014, in waters near ocean salinities close to Brandywine Shoal next to the shipping channel and close to the mouth of the bay. As in previous years, the majority (94%) of sandbar sharks caught were immature, with just over 10% of these as young-of-the-year; the remaining sandbar sharks caught were considered mature females based on length and girth measurements. Smooth dogfish were represented nearly equally by juvenile and adult fish in 2014, with young-of-the-year and adult females still dominating the catch. The sand tigers caught in 2013 were primarily immature sharks, but nearly 40% were considered mature based on clasper calcification for males and length and girth measurements for females. Delaware Bay continues to provide important nursery habitat for sandbar sharks, smooth dogfish and sand tigers. The extensive use of the Bay by all life stages of sand tigers and smooth dogfish continues to highlight the seasonal importance of this essential shark habitat.

Virginia

COASTSPAN sampling conducted by the Virginia Institute of Marine Science encompassed the mainstem of the lower Chesapeake Bay, as well as coastal inlet and lagoon habitats along the Eastern Shore of Virginia. Sampling was conducted using a stratified random design, with stratification based on depth and geographic location. Additional sampling was also conducted at historical fixed stations in the coastal waters of Virginia. Juvenile sandbar sharks dominated the catch in the bay, lagoon, and inlet habitats, and were second only to Atlantic sharpnose sharks in the coastal ocean sampling. Within the bay, inlets, and lagoons, the majority of sandbar sharks caught were young-of-the-year. Other sharks caught along the Eastern Shore of Virginia included five dusky sharks, two Atlantic sharpnose sharks, and one scalloped hammerhead. Within the Chesapeake Bay, 20 Atlantic sharpnose sharks, 15 spinner sharks, one scalloped hammerhead shark, and one smooth dogfish were also collected. Other species caught in the coastal ocean, in decreasing order of abundance, were: tiger, sand tiger, spinner, blacktip, dusky, scalloped hammerhead, and smooth hammerhead sharks. The majority of each species caught were immature, with the exception of the Atlantic sharpnose shark and the sand tiger. These findings highlight the importance of Virginia's coastal waters in providing nursery habitat for many coastal shark species. Virginia's estuarine waters continue to provide important nursery habitat for sandbar sharks.

North Carolina

Sampling conducted by the University of North Carolina in North Carolina's coastal waters occurred from May to November in 2014 at two fixed stations south of Shackleford Banks. Nine shark species were captured, the most abundant of which was Atlantic sharpnose. Other sharks captured, in order of abundance, were blacknose, spinner, blacktip, one juvenile scalloped hammerhead, one large juvenile tiger shark, and one adult female bonnethead. Additionally, one adult male smooth dogfish and an adult male spiny dogfish were captured in early May. The majority of sharks captured were mature (based on published length at maturity estimates), but juvenile Atlantic sharpnose, blacktip, and spinner sharks were also captured. Atlantic sharpnose sharks were also present as young of the year during 2014 sampling.

South Carolina

COASTSPAN sampling conducted by the South Carolina Department of Natural Resources took place in both nearshore and estuarine waters along the South Carolina coast including: Bulls Bay, Charleston Harbor, North Edisto, Port Royal Sound, St. Helena Sound, and Winyah Bay. Fourteen species of sharks were captured, the most abundant of which was Atlantic sharpnose. Other sharks captured, in order of abundance, were finetooth, bonnethead, sandbar, blacktip, blacknose, lemon, scalloped hammerhead, bull, spinner, smooth dogfish, nurse, and tiger sharks, and one of each great hammerhead and sand tiger. The majority of each shark species captured were immature, with the exception of these species: Atlantic sharpnose, bonnethead, and blacknose sharks, and the sand tiger. These findings continue to highlight the importance of South Carolina estuarine and nearshore waters as nursery habitat for many small and large coastal shark species and indicate the extensive use of these waters as habitat for several adult small coastal shark species.

Georgia

COASTSPAN sampling conducted by the Georgia Department of Natural Resources took place in the estuarine waters of the St. Simon and St. Andrew sound systems. Of the twelve species of shark captured, Atlantic sharpnose was the most abundant. Other sharks in order of abundance were bonnethead, blacknose, sandbar, blacktip, tiger, scalloped hammerhead, finetooth, smooth dogfish, spinner, bull, and lemon sharks. Four species captured were also present as young-of-the-year in estuarine waters: sandbar, Atlantic sharpnose, and blacktip sharks, and one bull shark. In addition, Atlantic sharpnose, blacktip, sandbar, smooth dogfish, scalloped hammerhead, and tiger sharks were present as young-of-the-year in Georgia's nearshore waters. The majority of sharks captured were immature, highlighting the importance of these areas as potential nursery habitat for both small and large coastal shark species. In addition, the majority of blacknose sharks and bonnetheads were mature, indicating these waters continue to provide important adult habitat for these small coastal shark species.

Atlantic Coast of Florida

COASTSPAN sampling conducted by the University of North Florida occurred within 2 km of Florida's north Atlantic coast in and around the following locations: Cumberland Sound, Nassau Sound, Tolomato River, St. Johns River, St. Augustine Inlet, and Matanzas Inlet. Species represented in the 2014 catch included, in order of abundance: Atlantic sharpnose, blacknose, blacktip, sandbar, bull, finetooth, scalloped hammerhead, bonnethead, spinner, lemon, great hammerhead, and nurse sharks and one spinner and one tiger shark. Nassau and Cumberland Sounds continue to provide nursery habitat for juvenile Atlantic sharpnose, scalloped hammerhead, and blacktip sharks. Nassau and Cumberland Sounds also provided nursery habitat for juvenile sandbar, finetooth, and bull sharks in 2014. Cumberland Sound and northern Florida's nearshore waters continue to provide habitat for adult female bonnetheads and mature blacknose sharks, respectively, as well. Additionally, adult female and young-of-the-year spinner and lemon sharks were caught in the coastal waters off Mayport, Florida in 2014. The multi-year seasonal use of the waters around Pine Island in the Tolomato River by neonate scalloped hammerheads continues to provide supporting evidence of an inshore nursery area for this species.

U.S. Virgin Islands

Sampling for sharks took place in the waters surrounding the Buck Island Reef National Monument off of St. Croix in May 2015. This is part of an ongoing multi-species, multi-age study of community structure and habitat use within the national monument. Three shark species were captured, tagged, and released in May 2015: tiger, Caribbean reef and nurse sharks. Additionally, in September 2015, the National Park Service tagged and released one lemon shark. All tagged sharks were immature, but none were young-of-the-year. Sampling in 2016 will take place in the spring and later in the summer to target the arrival of immature lemon sharks to the national monument.

Panhandle of Florida

GULFSPAN sampling covered 5 areas in the Florida panhandle: Mississippi Sound, Florida-Alabama border (Pensacola Bay and Santa Rose Sound), St. Andrew Bay to St. Vincent Island, Big Bend of Florida (St. George Sound to Anclote Keys, FL), and Pine Island Sound, FL. Sampling took place monthly from April through October. In 2014, nine species of sharks and three species of rays were captured; the most abundant of which was Atlantic sharpnose shark. Others included bonnethead, blacktip, scalloped hammerhead and finetooth shark, as well as cownose stingrays. The majority of the sharks captured were immature; indicating that areas along the Florida panhandle should still be considered potentially important nursery areas for both large and small coastal shark species as well as hammerhead species. Benthic habitats sampled included shallow seagrass beds, sand and mud.

Big Bend of Florida

2014 GULFSPAN sampling by Florida State University covered more than 300 km of Florida's coastline from St. George Sound to Anclote Keys. Longlines and gillnets were used to collect data. Thirteen elasmobranch species were caught, with three species (Atlantic sharpnose, bonnethead, and blacktip sharks) comprising 98.3 percent of the catch. Others included blacknose, bull, lemon, tiger, great hammerhead, nurse, and Florida smoothound sharks, as well as clearnose skates, cownose rays and southern stingrays. Sampling indicates that this region serves as nurseries for one species of large coastal shark (blacktip), and several small coastal shark species (Atlantic sharpnose, bonnethead, and blacknose).

Florida-Alabama Border

GULFSPAN sampling by the University of West Florida took place from Big Lagoon to the west end of Santa Rosa Sound, with the majority of sets occurring in Pensacola Bay. In 2014, three species of elasmobranchs were caught (blacktip shark, bonnethead shark, and cownose ray). Of the three sharks caught, the two blacktip sharks two were juveniles and the bonnethead shark was an adult. During the sampling season salinities were lower than normal which may have been impacted from flooding in spring 2014.

Mississippi Sound

In 2014, GULFSPAN sampling by the University of Southern Mississippi Gulf Coast Research Laboratory covered six regions of the Mississippi Sound in Mississippi state waters: west, central, east, inshore west, inshore central, and inshore east. Seven species of shark (Atlantic sharpnose (most abundant), finetooth, blacktip, spinner, bull, scalloped hammerhead

and bonnethead) were encountered. The cownose ray was the only ray species encountered during this sampling year. The majority of the animals captured (66 percent) were immature.

St. Andrew Bay to St. Vincent Island, FL

In 2014, GULFSPAN sampling by the NOAA Fisheries SEFSC Panama City Laboratory covered four major areas along the panhandle of Florida: St. Andrew Bay, Crooked Island Sound, St. Joseph Bay, and the Gulf of Mexico-side of St. Vincent Island. Eleven species of shark (Atlantic sharpnose (most abundant), bonnethead, blacktip, scalloped hammerhead, spinner, finetooth, blacknose, bull, sandbar, tiger and Florida smoothhound) were encountered. Four ray species (cownose ray, spotted eagle ray, bluntnose stingray, and smooth butterfly ray) were encountered during this sampling year. The majority of the sharks captured (67 percent) were young-of-the-year indicating the region continues to be used as nursery habitat.

Pine Island Sound, FL

In 2014, GULFSPAN sampling by Mote Marine Laboratory covered two areas in Charlotte Harbor on the southwest Florida coast. Five species of shark (bonnethead, (most abundant), blacktip, scalloped hammerhead, Atlantic sharpnose spinner, and blacknose) were encountered. Two ray species (spotted eagle ray and Atlantic stingray) were encountered during this sampling year. The majority of the sharks captured (70 percent) were young-of-the-year indicating that Pine Island Sound is nursery habitat for coastal sharks.

Conclusion

The data obtained from both COASTSPAN and GULFSPAN surveys continues to provide the information necessary to identify new EFH areas and to further refine areas already designated as EFH by determining specific habitat characteristics associated with these EFH. Time series for both surveys continue to be used in the stock assessments for large and small coastal shark species and are essential for monitoring these populations and their habitat use in the areas surveyed.

Chapter 3 References

Bethea, D.M., K. Smith, G. Casselberry, J. Carlson, J. Hendon, R. Grubbs, and T. Daly-Engel, M. Pflieger, R. Hueter, and J. Morris. 2015. Shark Nursery Grounds and Essential Fish Habitat Studies (GULFSPAN survey - 2014). Report to NOAA Fisheries, Highly Migratory Species Management Division.